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ABSTRACT

DEVELOPMENT OF THE RURAL SECTORS OF AFRICA IS DISCUSSED IN TERMS OF THE LONG-RANGE EFFECTS OF PROPER RURAL DEVELOPMENT. AS VIEWED BY THE AUTHOR, EFFECTIVE DEVELOPMENT OF THE RURAL SECTORS IS ESSENTIAL TO THE ECONOMIC AND SOCIAL FUTURE OF AFRICA. THE VALUE OF AGRICULTURAL AND ALLIED OCCUPATIONS IS SO IMPORTANT TO AFRICA AS A NATION THAT CAREFUL PLANNING IS OF UTMOST IMPORTANCE. TO ACCOMPLISH EFFECTIVE DEVELOPMENT, THE NATION MUST STRESS AGRICULTURAL EDUCATION AT ALL EDUCATIONAL LEVELS. INTEREST IN AGRICULTURAL DEVELOPMENT WILL NEED TO BE FOCUSED ON ALL ASPECTS OF THE RURAL AREAS: THE FARMER, THE FARM FAMILY, AND THE RURAL COMMUNITY. IN ADDITION, THE POTENTIAL OF WOMEN IN AGRICULTURAL AND RELATED OCCUPATIONS CANNOT BE OVERLOOKED. APPENDIX I INCLUDES THE 1965 AND THE PROJECTED 1975 AND 1985 AGRICULTURAL POPULATIONS IN PROPORTION TO TOTAL POPULATIONS; APPENDIX II PRESENTS A VALUE SUMMARY OF AGRICULTURAL TRADE IN 1965. (DE)

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EDUCATION AND TRAINING FOR RURAL DEVELOPMENT IN AFRICA

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INTRODUCTION

1. The major problems of economic and social development which confront the governments and people of many African countries today are basically similar. Emerging new societies, expanding populations, national hopes and aspirations, the need to develop local industry and commerce, the demand for education and employment opportunities, all imply a more rapid increase in the rate of economic growth. How is this to be achieved within the broader context of social change, the emergence of new communities, and the whole process of nation building? It would be easier if this transformation could be spread over a lengthy period of time so as to minimise the risk of costly mistakes. The urgency of the situation in so many countries, however, does not permit of slow evolutionary processes based upon careful experiment and time. Decisions have to be taken on development policies and priorities in the hope that they will result in rapid and sustained growth in all sectors of the economy. Fluctuations in the price and demand on World markets for the agricultural export products of so many developing countries add to the difficulties of long term national development planning. Another serious problem faced by many African countries today is that of finding employment for the increasing large numbers of young people, many of whom have completed some form of school education. In many cases, the expansion of local industrial and urban employment opportunities is totally inadequate to provide satisfactory occupation for the large numbers of boys and girls leaving school each year. Many other exceedingly difficult and complex problems face the governments of African countries today.

2. This paper is primarily concerned with development of the rural sector. It must however, be stressed, in passing, that the rural and urban sectors form part of what must be an integrated whole: they are essentially complementary. Sustained development of urban and industrial communities is, in most African countries, dependant upon expanding agricultural and rural productivity. There can be no satisfactory growth of towns and cities alongside poverty stricken rural communities based upon the hazards and miserable returns of subsistence agriculture. The incalculable contribution of the people of the countryside, and especially the younger generations, to national progress and development cannot be made if they are denied the benefits of health, good education and the opportunities for advancement which are only possible in a flourishing rural economy. Thus we see how the towns and industries are dependent upon the products of the rural areas for their supplies of food and many of the raw materials of manufacturing

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processes. We see, also, the dependence of local industry and commerce upon expanding markets for their products created by a steady increase in the purchasing power of rural people due to rising agricultural productivity. Finally, we can envisage the contribution which a happy and progressive rural society could make to national stability, endeavour and advancement.

3. It is exceedingly important that the unique position of agricultural and rural development in the future progress and prosperity of most African countries be recognised and given appropriate emphasis in national development planning and priorities. At the present time, and for many years to come, African countries are principally based upon an agricultural economy and the vast majority of their peoples live in rural communities. Indeed, it is not too much to claim that in most cases, agriculture is the basis of the life of these nations and agricultural development is the foundation of almost all other forms of economic and social progress in African countries. Some 60 to 95 % of the total population of most African countries live in rural areas (Appendix I). The basic occupations of these rural people are agricultural: the raising of crops, the keeping of livestock and all the related activities of an agricultural economy. National foreign exchange earnings through export trade is overwhelmingly derived from the products of agriculture (Appendix II). Directly and indirectly, agricultural production and the processing and sale of agricultural products provide a greater volume of employment than any other sector of the economy. Wherever agricultural production has expanded and profitable outlets have been established, industry, trade and commerce have followed in its train. The thesis upon which this paper is therefore based is that, for most African countries, rapid and sustained agricultural development, in the context of progressive and prosperous rural societies, is the foundation of national advancement. If this is true, then the rural sector, with its human and agricultural potential, are deserving of far higher priority and far more attention in national development plans, than has usually been accorded in the past.

4. Agricultural change and development involve many complex processes especially in countries where traditional systems of subsistence land use predominate with such features as fragmented holdings, common grazing of all livestock, and little or nothing of the essential infrastructure of a modern agricultural industry. In some ways, the technical aspects of improved crop and livestock production present the least difficult problems of development. In many countries today, agricultural research, experiment and technology have already provided the main guidelines for a rapid and substantial increase in agricultural productivity. The much more difficult and complex problem is how to get these scientific and technological improvements incorporated into agricultural systems and practices. There have been many attempts, involving a variety of different approaches, to improve and modernise peasant agriculture, over the past 30 years or so in Africa. Few have achieved any marked or lasting success, and the common pattern of rather poor and unproductive subsistence agriculture still dominates the African countryside. Can we learn from past experience? Are there new and different lines of approach which might lead to more rapid and sustained progress towards a modern and prosperous agricultural industry?

5. There is certainly evidence of much study and new thinking upon this subject. In this paper I shall confine myself to one major aspect of this problem: the human factor in agricultural change and improvement, and to some thoughts as to the manner in which education and training can contribute directly to agricultural and rural development. Many thoughtful people are now convinced that in the past far too little attention has been paid, in many countries, to the social and institutional implications of agricultural development. They believe that there has been a failure to recognise the vital importance of the <u>human resources component</u> of the whole development process. They find at least some explanation of lack of success in achieving rapid agricultural

progress amongst communities of subsistence cultivators and pastoralists, in the failure to recognise the importance of the individual farmer, farm women and their families, and the rural community as a whole, in the whole process of development. Thus, a significant change of emphasis is now clearly evident in planning the strategy of development and its economic and social implications. Perhaps the best evidence of this, within the United Nations family, is the 1967 Report on the Development and Utilisation of Human Resources in Developing Countries (1) presented to the 43rd session of the Economic and Social Council by the Secretary-General of the United Nations. Action arising from the Resolution (No.1274) which accompanied the adoption of this report, is likely to have a profound influence upon new and concerted action in regard to the human resources component of rural and national development. Viewed in this light, education and training can be seen as having a rôle of special significance in the progress of developing countries.

HUMAN IMPLICATIONS OF AGRICULTURAL CHANGE

6. Traditional systems of subsistence agriculture are usually characterised by features which are inconsistent with the essential requirements of modern economic farming. Farmers themselves and the society in which they live are, for good practical reasons, very conservative. The whole structure of society has been built and maintained in accordance with the relatively simple requirements of small and often isolated groups of people obtaining their livelihood in harmony with their environment. Both cultivation and the grazing of livestock were based, in most areas, upon large areas of available land. The introduction of cash crops, over the past 50 years or so, has done little to alter traditional patterns and practices. Agriculture is still mostly based upon the extensive principle - low yields from large areas of cultivated land or communal grazing areas. There has been incredibly little investment in the improvement of land as a productive asset and the essential services required by a modern farming industry. School education in traditional agricultural societies has often been used as the means whereby the more intelligent children hope to escape from the drudgery and poor returns of peasant subsistence agriculture to the better life and employment prospects of towns. Its contribution in stimulating the development of new and progressive farming systems has, so far, been negligible.

7. It will, I think, be seen that agricultural change and progress are ultimately dependent upon changes in the outlook, aspirations and desires of farmers, farmers' wives and children and the rural community at large. In order to move rapidly towards modern farming systems and techniques, traditional concepts of the use of land, labour and other resources, will need to undergo enormous change. Too rapid change could lead to disaster and therefore, in many cases, the process must be gradual, gathering momentum as experience is gained. As farming develops, the skills of management become ever more important to success. A complex infrastructure has to be created and built up to serve the needs of a modern farming industry. All these processes essentially involve people: the dissemination of new ideas and new knowledge. They are ultimately dependant upon the understanding and support of the farmer, farm women and the rural community at large. The latent forces of enterprise, initiative and endeavour must all be enlisted in the service of agricultural progress. And of what avail is agricultural progress if it does not contribute to a better life for the farmer, his family and the community in which he lives? Thus, from every aspect, rural development may be seen to depend ultimately upon the human factor and to have as its principal justification, the improvement in the quality and conditions of human life. All sectors of the rural community have an essential contribution to offer to national progress and development: farmers, farm families and rural youth; artisans, craftsmen and traders; government as well as religious and political organisations; the major means of communication - press, radio and television.

EDUCATION AND TRAINING

8. The fundamental importance of the system of general education to all economic and social progress in developing countries requires no additional emphasis. It is the basic foundation upon which all vocational, technical and professional education and training are built. It is essential for the effective use of many of the mass media of education and development. It can be the most powerful vehicle of new ideas and concepts. Education is thus a tool of immense power and influence and it is not surprising that its expansion and development have featured so large in the budgets and plans of so many of the developing countries. It is also widely regarded as a basic human right.

9. The major problem which most of the developing countries now face is that of modifying and adapting their educational systems to meet the aspirations, needs and conditions of national progress and development. It is hardly surprising that educational systems, evolved over a long period of time to serve the needs of largely urban populations of highly industrialised countries, have not proved entirely suitable for countries which are mainly rural and agricultural and are now emerging from a traditional subsistence economy. This is not to say that these systems have not, in fact, made important and fundamental contributions to development through the training of teachers, professional people and technicians as well as the clerical and other staff required for expanding government services and urban and industrial occupations.

10. It is, however, widely apparent that for the kind of life and work which the bast majority of young people are bound to have to follow in the foreseeable future in most of these predmoninantly agricultural countries, the present educational systems have limited relevance. This is not to suggest that they be replaced by agricultural training. Something much more fundamental is needed in many cases: the examination of the whole system of education and training in the context of national aspirations and the vital needs of economic and social development. At present much education in rural areas tends to create in the minds of children ambitions and hopes for types of urban and industrial employment in which present opportunities are exceedingly limited. On the other hand, the prospects in subsistence farming and other rural occupations are so unattractive to educated young people that urban unemployment and rural underemployment are widespread social problems. The recent Williamsburg Conference on the World Crisis in Education has drawn attention in a dramatic manner to these fundamental issues (2). An exceedingly fine and practical analysis of the problems faced by a recently independent African nation in forging its own system of education to meet national aspirations and needs is provided by the Report of the Education Conference on the Arusha Declaration and the New Policy on Education for Self-Reliance (3).

11. Many attemps have been made in the past to introduce an "agricultural bias" into systems of rural education. In other instances "agricultural high schools" or agricultural streams in the secondary school system have been developed. In a number of countries school gardens, for the main purpose of instructing children in agriculture have been introduced. Yet elsewhere, "school farms" have been established to give a largely practical training to primary school leavers to enable them to enter farming as a career. There must, indeed, be few countries in which there have not been attempts of one kind of another to devote part of the rural school system to the training of children for agricultural life and occupations. Generally speaking, many of these schemes and projects have led to very disappointing results. Indeed, in many instances, it is only too clear that the majority of children, and particularly the more intelligent, do not want to follow the agricultural occupations of their parents and forbears and look to the school system as the principal means of escape from the drudgery and poor rewards of peasant agriculture. There are, however, other reasons why these attempts to incorporate agriculture into the school system have not been successful. The most

important has little to do with the educational system: it is that agriculture, as it exists at present in many countries, enjoys so little prestige and offers such poor incentives and limited possibilities of improved farming that it is not worth entering as a career if any alternatives are available. Thus, until there are government policies aimed at the development of a modern and progressive agriculture, offering reasonable security and rewards to the farmer, there is little point in trying to use the school system to prepare young people for farming.

12. There are, however, other important considerations. The primary school system is not the place to try to teach technical agricultural subjects. It should be concerned in providing all children with a sound basic education. Naturally, its orientation and content should be greatly influenced by the environment: physical, biological, social and economic. Both the system and the subjects taught should offer a marvellous opportunity to develop in children's minds an intelligent interest in the plant and animal life around them, the society in which they live and the life and occupations of the people amongst whom they are growing up. There is an urgent need for the whole educational system to be far more "development oriented" (4). Through the more formal subjects they are taught, children should constantly be made aware of their implications in rural betterment and national progress. Is not the school the place where the new image of modern agriculture can be created and children taught how the application of science and technology, combined with human skill, experience and endeavour, can transform the present scene of poor subsistence crop growing and cattle herding into new systems of progressive farming? Not only should the school garden become a most exciting laboratory, but it can, under intelligent management, be a source of pride and beauty to the school. These, it would seem, should be some of the basic considerations behind reform of present school systems.

13. It is very reasonable to suggest that the school system, at both primary and secondary levels, should prepare young people for their entry into adult society. It is also reasonable that the subjects taught should have some practical application in the life and occupations which children will subsequently enter. In the case of agriculture, a sound basic education is far more important than the learning of techniques, for these can often be much more effectively and economically taught outside the school system. The modern farmer, needs the basic skills of management at least as much as an understanding of the techniques of crop and animal production. A sound and practically oriented education will enable him to use his limited resources to best advantage. Not only must he learn to keep proper records of his business but he will need to understand many technical matters associated with credit, marketing, the use of fertilisers, feeding stuffs, machinery and agricultural chemicals for pest, weed and disease control. Surely through intelligently devised school curricula and syllabi in the formal school subjects - in mathematics, the sciences, geography, writing and reading - sound foundations can be laid upon which new rural societies and progressive agriculture and rural industries can be built? There is also an important place in the educational system for voluntary, out-of-school activities as, for example, Young Farmers' Clubs, activities based on the 4-H Club pattern of America and so on. Through such projects, children may learn many of the skills and techniques of crop and livestock husbandry as well as service to the community and nation. There need not be, nor should there be, any difference in academic standards between rural and urban education. Both must provide a satisfactory preparation for adult life and society. Both must provide an opportunity for those suitably qualified to go on to higher and technical education and training.

EDUCATION AND TRAINING FOR AGRICULTURAL DEVELOPMENT

14. Under this heading is included all technical education and training related to the improvement of agricultural production. For purposes of discussion, it may broadly be classified into three main levels: -

1. Higher Agricultural Education

2. Intermediate level agricultural education and technical training

3. Vocational agricultural education and farmer training.

In most countries the institutional structure of agricultural education can be fitted into the above framework. It must, however, be mentioned that there is considerable diversity between countries in the organisation of agricultural education. In the majority of countries of the World, agricultural education is the responsibility of ministries of education and agriculture, and in yet others it is under ministries of agriculture and food. What would seem to be important, particularly in the developing countries, is that ministries of education and agriculture and other ministries directly concerned with rural development should work in the closest cooperation in the field of agricultural education. It is obvious that technical education and training in food and agriculture, if it is to be relevant and effective, must be organised and developed in the closest contact with the agricultural production services, including research and field extension.

15. In many of the developing countries, systems of agricultural education and training have evolved, not in response to development planning needs, but in an ad hoc fashion to meet exigencies, as they arose, for trained staff for the agricultural and related services (5). Since in most of the former colonial dependencies, professional and senior technical staff for agricultural research and administration came from the universities and colleges of the metropolitan power, local agricultural training facilities were usually developed solely for the purpose of training rather low level field and other technical assistants. Compared to the attention and funds devoted to agricultural administration and research services, the support for agricultural education was very meagre. Furthermore, the various departments associated with agricultural development: animal health, forestry, cooperatives, etc., tended to establish their own training institutions, often in relative isolation, without reference to any coordinated plan of technical education and training. In the absence of local university faculties of agriculture, these low level training institutions were sadly lacking in professional leadership and technical support.

16. From what has been said it will be clear that in many of the developing countries of the world, agricultural education and training are only now beginning to reach a stage of organisation and support when they can begin to make an effective contribution to the urgent needs for trained manpower for agricultural development, within the context of national development plans. However, as in the case of "imported" systems of general education, there is a widespread and urgent need for modification and adaptation to meet local conditions and the needs of a developing economy and society, in the case of agricultural education and training. Furthermore, these branches of technical education are inevitably expensive in terms of facilities, staffing and equipment. For all these reasons, there is a compelling case for both regional and national planning of agricultural education in relation both to the basic systems of education and to the requirements implicit in national development plans. The essential basis for such planning is the systematic assessment of the needs for trained manpower at all levels and in all aspects of the agricultural sector of the national economy. In

the rapidly changing situation of so many developing countries, it is clear that these processes of manpower assessment and educational planning must be systematic and continuing (6). Furthermore, there is an equally important need for the regular revision and adaptation of technical education and training to meet the requirements of change and development of the agricultural industry.

17. Some brief comments are now offered on the three main types or levels of agricultural education. Perhaps the most important observation of all is to reaffirm two principles:-

1. That efficient service from those trained for work in each one of these different levels of agricultural education and training is essential to sound and rapid agricultural progress. Agricultural scientists, technicians of many kinds, and the skilled producer and manager complement each other's work in raising the efficiency of agricultural production. We cannot do without any of these categories of agriculturists. Each essential element must therefore be accorded due status and reward in relation to the part it must play in the total effort for agricultural progress.

2. The types of education and training required to produce efficient persons in these three major categories are different in purpose and character and should not be confused. Far too often intermediate level agricultural training is the "pale shadow of a university degree course" taught by young graduates from their own university course notes. Seldom is the teaching staff of such institutions adequately supported by the services of skilled technicians to supervise practical training. Intermediate technical training in agriculture is meant to develop real skills in farm management and the modern techniques of crop and animal production, the use of machinery and irrigation, etc. Let us aim to produce the skilled technician who stands in his own right as one of the indispensable elements of the agricultural profession and is not someone who is inferior to the graduate in agricultural science. Likewise, vocational training for the farmer, for rural women, for village craftsmen and others needs to be accorded its distinctive character and dignity.

HIGHER AGRICULTURAL EDUCATION

18. Although the term higher agricultural education commonly includes higher technical training in agriculture, my remarks under this heading are confined to university faculties ofagriculture. In the whole field of agricultural education, the university faculty of agriculture occupies a position of special importance. It is the place where most of the leaders of the agricultural profession are taught. It is the place where agriculture - so fundamental to the nations' life, prosperity and progress - is represented at the highest level. It is the place where agricultural science is afforded the opportunity to give to the agricultural profession status and prestige through the excellence of its research and teaching. Since the staff of many agricultural training institutions at the intermediate and vocational levels will be its alumni, the university faculty of agriculture can provide a continuing source of inspiration and technical leadership to the whole system of education and training in agriculture. A significant proportion of textbooks and teaching materials for all levels of agricultural education and training must emanate from the resources of the university.

19. For the reasons just given there would seem to be an almost unanswerable case for siting university faculties of agriculture within the main university complex even though facilities for practical training and university farms or field stations may have to be some distance away from the main school of agriculture building, with its laboratory and other facilities for teaching and research in the agricultural sciences. It would appear to be of fundamental importance that, in both teaching and research, the work of university faculties of agriculture is closely linked with that of the science, social science, engineering and other related disciplines of the university. Equally important is the need for agriculture students to be university students in the full sense of this term, sharing in the life and activities of the university community, making use of university library, games, society and other facilities. A university education should mean far more than technical or professional training in a specialised discipline. The standing of the agricultural profession and the influence of its work depend upon much more than technical competence.

20. It will thus be clear that both universities and, in particular, university faculties of agriculture, in the developing countries (and, in this respect, most countries must be regarded as developing) have an exceedingly important function to perform in the reshaping and reform of education and technical training to meet the needs and conditions of agricultural change and development. How many faculties of agriculture are gearing their research activities to major needs of agricultural development rather than problems of academic interest? How can a subject such as Agricultural Economics be taught in a country emerging from subsistence agriculture if there has been no significant research into the economic and social aspects of local peasant agriculture and rural communities? Of what relevance to peasant agricultural development is the economic research of highly sophisticated mechanised agriculture in large and highly capitalised farming enterprises in a temperate environment? Similar questions could be asked in regard to soil fertility problems and many aspects of the applied agricultural sciences. And yet, the broad patterns of curriculum structure, of syllabus content and the majority of textbooks used in the faculties of agriculture of developing countries are still those of university institutions of Western Europe and America. Here then is a field of activity in which the emerging universities of developing countries and their faculties related to the expansion and improvement of agriculture have an enormously important rôle to play in the adaptation of their philosophy, teaching and research to local conditions, needs and aspirations (7).

21. It is also obvious that if the work of university faculties of agriculture is to relevant to the needs of development, and the teaching of students is to inspire and prepare them to play an effective part in agricultural transformation, then these faculties and their staff members must be actively involved in research and closely associated with the work of the agricultural advisory services. The divorce of agricultural teaching from the other elements of agricultural improvement - research and extension services - can only mean that much of the teaching is highly theoretical and lacks practical application and relevance. There is no perfect or wholly satisfactory answer to this problem. It must be resolved by each country in accordance with its needs and circumstances.

22. Agricultural research is normally the responsibility of the Ministry of Agriculture. This is a very good arrangement insofar as it is important to gear research to solving important and urgent problems of agricultural production. However, university faculties of agriculture and indeed other university faculties concerned with economic and social development must engage in active programmes of research. In some countries there are also autonomous agricultural research institutions. There would appear to be a strong case for the setting up of national or regional advisory councils for agricultural research on which there is adequate university representation and within the context of which faculties of agriculture, veterinary science, etc. are allocated a part, according to their resources, of the total national programme of agricultural research.

In like manner, ways and means need to be devised to establish viable working relationships between faculties of agriculture and the agricultural field services so that staff and students are constantly aware of the actual problems facing agricultural development generally and the farmer in particular (8). The absence of such relationships have been a great weakness of agricultural education and training at all levels in many of the developing countries in the past.

23. Finally, as new faculties of agriculture become established and gain strength and standing they have the opportunity of providing other services in support of agricultural development. There can be little doubt that in-service training must become a much more important feature in assisting professional and technical staff to render efficient service in a dynamic and changing economic and social situation. Teachers need short specialised courses to enable them to keep up-to-date. There is a need for the convening of scientific symposia for research workers and others. Even more important, perhaps, is the need to extend the advantages of the university to those who have not had the opportunity of university education through extra-mural courses and short residential courses during vacations for various categories of people connected with rural development. In these ways, the university by opening its doors to a wider public, begins to serve the whole community in new ways and identifies itself much more intimately with national aspirations and the whole development effort. In some instances, university faculties of agriculture have taken the initiative in the formation of national or regional councils of agricultural education which, for the first time have brought together representatives of the ministries of agriculture and education, university and other levels of agricultural education, research interests and those of the agricultural industry, to advise upon ways and means by which agricultural education and training may give better and more efficient service to the development of agriculture (9). These examples may perhaps serve to illustrate the opportunities and wider responsibilities which universities and their relevant faculties may render to development, particularly in the rural sector.

INTERMEDIATE AGRICULTURAL EDUCATION AND TRAINING

24. It would be difficult to overestimate the importance of the intermediate level agricultural technician to agricultural progress in the developing countries. In this category are included the vast numbers of agricultural extension workers, animal health assistants and technicians of many kinds through whose work the results of research and technological progress are conveyed to the farmer and incorporated in agricultural enterprises of every kind. If intermediate level staff are inadequate in numbers or of low competence, then much of the expenditure on the professional staff of the agricultural services is wasted. Depending upon the stage of development and the principal types of agriculture practiced, there is probably a need in developing countries for 5 to 10 times as many agricultural technicians as agricultural scientists. Besides requiring an adequate general education, the technician's training is fundamentally one of practical application. Not only must he be able to perform efficiently a number of skilled techniques associated with the various aspects of modern agricultural production, but he must understand the basic principles which underlie them. Furthermore, he may often be required to explain and demonstrate these techniques to farmers in a convincing and effective manner (10). Since modern farming is essentially a business undertaking, he will often also need to know a good deal about the techniques of management. It will be seen that the practical know-how of the agricultural technician is something very different from the mere acquisition of a modicum of skill in the manual processes of traditional farming.

25. A criticism frequently levelled against intermediate level agricultural education in developing countries is that it fails to produce the type of technician required for the more practical implications of agricultural development. The products of these institutions are often far more suited to "white collar" office jobs than to the many tasks of agricultural production for which they are so urgently needed. Indeed, a number so trained may not go into agriculture at all. Whilst many of these criticisms may be justified, the reasons why the training is ineffective may not be the fault of the institutions concerned. Often this type of employment enjoys career prospects and status far below its importance to national development. In the staffing and facilities, particularly those for practical training, of institutions of intermediate agricultural education, totally inadequate consideration is given to the nature of the technical training required and the minimum requirements for efficient teaching and practical training. It also not infrequently happens that owing to the inequalities of rural and urban education, the majority of students come from an urban background having no knowledge of, and little interest in, rural life and occupations. It is exceptional for the teachers of intermediate agricultural training institutions ever to have led any training themselves in the principles of education and methodology of teaching.

26. In these circumstances, it is hardly surprising that in many developing countries intermediate agricultural education lags far behind other forms of technical education and training. In spite of the devoted work of many teachers, it is in need of reform and adaptation if it is to play its proper part in the vast programme of agricultural change and modernisation. Here again, the whole process of proper national planning in regard to the specific needs of agricultural development is of the greatest importance. It is essential that much more consideration be given to the technical jobs for which training is required and the facilities needed to provide such training in the most efficient and economical manner possible (11). There is a strong case for grouping together in a single institution, well staffed and properly equipped, the intermediate training facilities for a whole range of specialisations related to africultural and rural development (e.g. agriculture, forestry, animal health, range management, home economics, cooperative management, horticulture, etc.). It is also important that such institutions be sited in such a way that their teaching can effectively be linked with applied agricultural experimentation and also with the essential agricultural services for development (extension work, rural credit, cooperatives and marketing, provision of farm requisites, etc.). The training of teachers and technical assistants for work at the intermediate level and the provision of relevant textbooks, manuals and other teaching materials are matters of the greatest importance to which quite inadequate attention has been given in the past. Finally, in the improvement of technical training of all kinds associated with agricultural development there is a very great deal to be learned from recent experience in training for industrial and other technical fields.

TRAINING FOR MODERN FARMING

27. It would be difficult to exaggerate the importance of education and training to farming development and improvement in countries where the main patterns of land use and the rural economy are still predominantly of a subsistence character. At the same time, it is important to stress continually the fact that investment in education for agricultural development will be largely wasted unless it is set within the broader context of national agricultural development planning, in which full attention is devoted to all the major constraints affecting the initiation of agrarian reform and the development of modern systems of economic farming. Under many existing circumstances, in areas of peasant subsistence agriculture, more advanced systems of farming are neither practicable nor economic. If the majority of individual land holdings are fragmented and scattered; if there is no fencing and all cattle are herded communally; if there is no

satisfactory system for the marketing of agricultural products; and if credit and farm supplies are vitually unobtainable by the small farmer, there is little point in endeavouring to teach new and improved systems of farming which no-one can put into practice. It is therefore within the context of integrated national and regional plans for agricultural development, in which attention is given to the sound organisation of agricultural services and the supporting institutional structure that farmer training is considered in this paper.

28. Some of the implications for national systems of education in a predominantly rural society based upon an agricultural economy have already been considered. It now remains to discuss, more specifically, the technical and vocational training of the producer or operator for the evolving new systems of agriculture and their practical implications in varied types of farming enterprise. This technical and vocational training falls broadly into two main categories:-

1. Training of young people destined eventually to enter farming and related occupations.

2. Training of adult farmers and others for new and improved systems of farming.

TRAINING OF YOUNG PEOPLE FOR FARMING

29. There have been many projects in developing countries, more especially since the end of World War II, to train young people for farming careers, in addition to those, immediately after the war, concerned with the training and settlement of ex-servicemen. These schemes and projects have been undertaken both by government agencies as well as philanthropic and other organisations. A number of them have been devised in order to try to cope with the increasingly grave problem of unemployed school leavers in rural areas. Sometimes such schemes have been grafted onto the school system itself. In other cases, special vocational training centres, called Farm Schools, or Institutes, have been established. Other types of vocational training have been developed, for example in Eastern Nigeria, in connection with large-scale settlement schemes for young farmers. It is hardly surprising that, in spite of many failures and disappointments, interest in training young people for farming and other related careers in the rural sector is still increasing, due largely to the exceedingly difficult problems of finding useful employment for large numbers of school leavers and other young people for whom urban and industrial employment opportunities are at present so few.

30. Within the limits of this paper, it is only possible to mention some important aspects of this complex problem. It may be worthwhile to consider why so many of these projects in training young people for farming careers, for example in Farm Schools, have led to such disappointing results. Indeed, in many cases, the majority of those so trained have not gone into farming at all but have made use of their further education to seek paid employment in other sectors of the economy. Perhaps the most important single reason for lack of success is that possibilities and incentives for this type of farming for which these young men have been trained more often than not do not exist locally. They have been trained to become independent yeomen farmers practising relatively complex systems of intensive farming which require land units of viable economic size, substantial capital investiment (fencing, water, buildings, equipment, livestock, etc.), credit for operating expenses, processing and marketing facilities, efficient cooperative organisations, and other "inputs" of a modern farming industry. It is true that under some schemes young men who have been trained in Farm Schools leave with a small sum of cash (which they may have earned from their individual or communal plot at the school) and also some simple items of basic farm equipment. They may even, as in the Nigeria settlement project, be provided with 50 acres of government land. Why then have results been so disappointing?

31. Some fundamental reasons have already been suggested. I believe there are others provided by farming experience in many parts of the World. Successful farming is not just a simple matter of learning and applying techniques in the growing of crops and the production of livestock. It is, in fact, a very complex business involving many factors such as climate, diseases and pests, fluctuating market demand and prices which do not, in the same way, affect many other commercial enterprises. Farming in the tropics often involves hazards far greater than those confronting temperate agriculture, especially in areas of low and unreliable rainfall. Successful farming depends, to no small extent, upon an understanding of the local physical and biological environment - soils, climatic factors, seasonal changes, etc. Such understanding is, in practice, acquired through working with farmers of long experience and through the accumulation of individual experience, season by season, in farming on one's own account. It must also be obvious that farming involves constant decision making in the in the use of labour and other limited resources and in the taking of risks. How then can young unmarried men of 18 to 20 years of age be expected to move straight from farm school into independent farming? In most parts of the World quite a long practical "apprenticeship" is necessary before a young man can hope to set up as an independent farmer. He requires maturity, experience, sound judgement, considerable knowledge and practical skill in many aspects of crop and livestock production. He could not function without a wife, and often a family, to support and help him. Thus in most countries a man is unlikely to be able to become an independent farmer under the age of 30 years. Between leaving school and becoming a farmer he has had to gain his experience and save money by working for others. The preparation of young people for farming and related occupations to be realistic must take all these factors into account. Inevitably it is a long and slow process. It involves the complementary "inputs" of vocational training and the skill and experience which can only be gained within the farming industry itself.

TRAINING OF ADULT FARMERS AND FARM WOMEN

32. Up till fairly recently the work of agricultural improvement in areas of peasant agriculture was mainly dependent upon the activities of the advisory or extension services. The field staff responsible for conveying advice and instruction to the farmer have been variously designated Agricultural Assistants, Instructors, or Agents. Such persons are often of relatively low educational attainment and have been given a 1 or 2-year "certificate" level of agricultural training. Whilst it could be claimed that quite a number of agricultural improvements and the successful introduction of new cash crops has been undertaken through the medium of the field extension service, it is equally valid to state that their total impact in changing systems of farming and increasing the efficiency of agricultural production has often been very limited. In those relatively few cases where an agrarian revolution may be said to have occurred, many other factors (e.g. land reform) have been involved and extension effort has been reinforced by such measures as farmer training and the extension service itself has been concentrated at far higher levels than usual in these "development" areas. In a number of developing countries, new forms of education, training and instruction are rapidly developing to supplement and strengthen the traditional field extension service. These include work-oriented adult literacy campaigns, farm broadcasting programmes, instructional literature and farmers' papers ("Ukulima wa Kisasa", published monthly in Tanzania, is an outstanding example) and institutional training of adult farmers. This latter aspect will be briefly discussed.

33. The Farmers' Training Centres or District Farm Institutes of East and Central Africa have all been established within the past decade and mark a significant development in the field of farmer training which should be regarded as a much more intensive form of extension. The need for a much more intensive system of training arose in places such as Kenya following land consolidation and the establishment of

planned holdings based upon entirely new systems of intensive farming and the introduction of valuable cash crops and high producing dairy cattle and other livestock. These changes involved a huge investment of government funds and it was realised that these far more sophisticated types of farming required much more effective training of large numbers of "modern" farmers than had hitherto been possible with the aid of Agricultural Instructors. Farmer Training Centres to provide residential short courses began to be established in the late 1960's. These F.T.C.'s usually had buildings of a good standard and well equipped for residential and teaching purposes. They have a farm and demonstration plots and are staffed by officers and instructors who are well trained and have field experience. Specialist officers can be brought in to contribute to teaching and demonstration. Courses usually vary from 4 days to three weeks but the most common and successful one for farmers is about one week. Residential accommodation may be as small as 20 beds and there are 90 and 100 bed centres. Much use is made of a range of audio-visual aids to illustrate the classroom, workshop and field lessons. Courses are offered for farmers, their wives, chiefs and village leaders, youth leaders, cooperative staff and other groups involved in rural development. Many centres play an extremely important rôle in providing periodic in-service training courses for field extension staff and others. Initial capital costs for the establishment of Farmer Training Centres vary greatly. In Kenya where building standards are generally high, a 30-bed centre (complete) costs about £ 20,000; a 60-bed centre £ 35,000; and a 90-bed centre £45,000. The first 16 centres built in Kenya cost £ 425,000 of which about 40% was contributed by non-government sources. Recurrent costs in these centres, apart from staff salaries, are about £ 1,200 a year, the cost of food being covered by fees charged. When staff salaries and wages are included the annual recurrent cost is £ 2,500-3,500 a year. Based upon average attendances this means a cost of about shgs. 10/- per student day. The staff of these centres consists of a Principal and, in the large ones, a Vice-Principal, of senior technical officer rank supported by 4 or 5 Instructors of whom 1 is generally a woman responsible for Home Economics courses. Although the majority of the 30 Farmer Training Centres in Kenya are government institutions, a substantial number have been established and are run by non-government organisations such the Christian Council of Kenya. The extent of outside interest and support is perhaps one of the most convincing proofs of the practical value of this new approach to farmer training as an aid to rapid and sustained agricultural development. There are now more than 30,000 small holder tea growers in Kenya and up to 50,000 exotic dairy cattle owned by small farmers making use of artificial insemination services and marketing much of their milk through cooperatives. Farmer training has played a vital rôle in the settlement of thousands of small African farmers in new areas. In 1965, some 37,158 persons (26,431 men and 10,727 women) attended residential courses at the 28 Farmer Training Centres of Kenya then operating (12). In 1966 there were 29 F.T.C.'s of which 19 centres were operated by the Ministry of Agriculture and Animal Husbandry. In these latter, total attendance was 23,841 of which 16,710 were farmer students and 7,313 mainly field staff attending in-service training courses. It will be appreciated that training on this scale can have an enormous impact.

34. What is the peculiar value of type of training and in what circumstances is it appropriate? Residential farmer training only becomes a profitable investment when the transition from subsistence agriculture to economic farming is beginning to make rapid progress, e.g. when there is a real need for training in modern technical skills and farm management. When it can be shown that new crops, productive livestock, improved techniques and greater investment can bring good cash returns, then there is both a need and a demand for farmer training courses.

35. Although it is essentially an integral part of the field extension service and must be so regarded the work of these new Farmer Training Centres offers certain advantages over the more orthodox field extension methods:-

(1) It has excellent permanent facilities and equipment for teaching, demonstration and practical work.

(2) It has professional staff i.e. through courses at the centre the farmer is brought into direct contact with experienced technical officers of a far higher level than the field extension worker.

(3) Through operating in groups in a residential centre farmers, farmers' wives and others share ideas and experience and learn from each other.

(4) Training in specialised aspects of farming and new techniques can be done in depth and far more can be achieved than through a single field talk or demonstration in the farmers home area.

(5) The centre can, through in-service training, keep field extension staff up-to-date and they then "follow-up" the courses given to farmers.

36. A number of surveys have been undertaken in the countries of East Africa in an attempt to evaluate the practical results of farmer training courses (13). All of these suggest that well run courses at these institutions have achieved a far greater impact in the adoption of new and improved techniques than through the more traditional methods of the field extension service operating in those countries. Both are indeed necessary for they complement each other and are part of the same process of education for change and improvement. Much has yet to be learned about these new approaches to agricultural development through farmer training. Whilst facilities and equipment are important the vital factor in success is the teaching staff of these centres. Special qualities of skill, experience, devotion to duty and interest in people are called for in this type of work. Teachers at all levels must be well trained, adequately supported by library and other facilities, and given career prospects in teaching which will ensure continuity of staffing and good work. As an integral part of the extension services, farmer training institutions need to avoid the temptation of regarding themselves as separate and independent for the effectiveness of their work depends upon the fullest cooperation with the field services.

EDUCATION AND TRAINING OF RURAL WOMEN

37. At the first FAO regional seminar on Agricultural Education in Africa, held at Makerere University College in September 1963, the Chairman in summing up the most important issues raised had this to say on the subject of the education and training of women (14).

> "It seems remarkable that although women play so important a part in peasant subsistence agriculture in Africa they have received so little attention in Agricultural Education or in schemes of rural improvement. This situation is even more difficult to explain if one considers the immensely important part women could play in the whole field of rural progress if they could be raised from their present lowly status and given the opportunity, through education, to play their full part. It is a grave reflection upon the present attitude of many in authority, that those who wish to establish training in Home Economics appear to have to go somewhat apologetically to this institution and ask if this can be considered as a fit subject for inclusion in the courses offered. Once again, it is worth referring to the American Morrill Act of 1862, which sought to establish Home Economics as a proper and respectable university subject. Through the development of Home Economics departments in the Land Grant Colleges, many thousands of young

> women have had the opportunity of university life and study. Not only have they gained through this association; the life of the university has been greatly enriched by their presence. Their contribution to life and society in American is beyond calculation. May I make a plea that we try to become less "hidebound" in our attitude to Home Economics and more realistic in regard to the unique and essential contribution which only educated women can make to development and progress in Africa? If we could bring ourselves to accord a full and worthy place to the study and teaching of Home Economics in our African universities, I should be very surprised if those who follow after us are not exceedingly grateful. It follows from what I have said that I consider also that there is an important place for the training of women in Agriculture."

38. Although considerable progress has been achieved since 1963, especially in regard to the development of secondary education for girls, it is still true that in terms of relative numbers of boys and girls at all levels of education, and more particularly at the higher levels in the scientific disciplines, the educational advantages are still heavily in favour of boys. Although the teaching of Home Economics is expanding there is still a great need for the understanding of the nature and importance of the contribution it can bring to both rural and urban development. There can be no doubt in many of the developing countries regarding the importance of closely integrating the teaching of both home economics and nutrition with agricultural studies at all levels. Recognising this fact, a regional seminar on "Training for Women in Agriculture and Home Economics" was organised by FAO at the invitation of the Government of Uganda and Makerere University College in May 1967 (15). It is significant that there are now women studying at the degree, diploma, and certificate levels both in agriculture and home economics in East Africa. The women's programmes are planned at the same range of training as for the various agricultural courses. The main problems are that there are still too few girls coming up the science stream in secondary schools and the facilities for the training fo women in agriculture and home economics are still very inadequate. As has been stressed elsewhere in this paper there is a very important need to develop courses in both these major fields which are relevant to the needs and conditions of each country and not just importations from other parts of the World. In particular, there would seem to be a strong case for considering the extent to which agriculture should be incorporated into home economics courses and vice-versa.

39. Although, as has been stated, progress has been slow in recognising the fundamental part which educated girls and women can play in agricultural and rural development, there is increasing evidence in many African countries, of a very marked change of opinion amongst leaders, government officials, and non-official organisations. The 1967 Kenya Agricultural Education Commission, for example, recommended amongst other matters, that "places should be provided for women at all intermediate level institutions so that by 1980 approximately one-fifth of all students are women (16). Mixed courses of men and women are now a common feature of Farmer Training Centres and men have begun to take a great interest in courses on human nutrition given by trained women home economists. In his speech at the Egerton Agricultural College of Kenya, in December 1963, the President, Mzee Jomo Kenyatta said "Kenya is being built by women, and we must not forget to include them in our agricultural training"(17). Home Economics courses are now a feature of the work of several African universities and are expanding rapidly at the intermediate level. Increasing numbers of girls are entering agricultural training courses and employment opportunities are being created for them. However, the rate at which these important changes and developments are taking place is still slow. There is an urgent need to educate public opinion and to enlist support of all kinds to expand and strengthen the education and training of women and girls to enable them to

play their full and proper part in rural development. Too many people still acquiese regarding the importance of women's education but fail to take active steps to ensure that girls are given equal opportunities with boys in the school system and in subsequent vocational, technical and professional training.

CONCLUSION AND SUMMARY

40. In most African countries today development of every kind is primarily dependent upon the rural sector of the economy. In practical terms, this calls for a rapid and sustained increase in agricultural productivity. It is essential that a much higher level of priority be accorded to the rural sector in the planning and financing of national development. In the whole process of agricultural and rural development, far too little attention has been given, in the past, to the importance of the human factor. Neglect of this aspect must be considered as one reason why the vital process of transforming peasant subsistence agriculture has met with such limited success in spite of scientific and technological knowledge about many aspects of agricultural improvement. The development and utilisation of human resources as an essential "input" of agricultural change and progress is now, therefore, receiving far wider recognition. Education and training provide the foundation of human resources development. However, in order to achieve their objective they must be relevant to the needs, conditions and resources of each country. They must also be regarded as an integral part of a broader national policy of development incorporating all the essential elements, or "inputs", required for a balanced approach to regional and national development.

41. In order to achieve the maximum rate of economic and social development and to use available resources to the best possible advantage, planning is essential. This argument has special significance in the educational field where the needs are enormous and the resources limited. Planning the development of education and training for the rural sector implies a knowledge of the requirements of agricultural development, which is central to economic and social progress. Thus, the assessment of the needs, short-term and longer-term, for trained manpower in all sectors of the agricultural economy, and at all levels, is seen to be a most important continuing process to provide the framework of institutional planning. It is impossible to devise appropriate curricula and to provide essential facilities for agricultural education and training in the absence of detailed specification of the many technical and professional duties for which trained people are required. Therefore, "job specification" is also an important component of the planning of technical education and training for agricultural and rural development, within the context of national development planning.

42. Agricultural education and training fall, broadly, into three categories: higher, intermediate and vocational agricultural education and training. These three types or levels have different objectives and serve different needs in agricultural development. It is most important that this fact be recognised in curriculum planning. Of equal importance is to appreciate that all levels, need to be developed as an integrated whole, each level complementing the others and contributing to their effectiveness. The most vital aspect of developing the whole structure is teaching staff: their selection, professional training, technical support and periodic in-service training. There is also a great and urgent need for the supply of textbooks, manuals and teaching materials for use, at all levels, in developing countries. These need to be based upon local needs, local research and experience, and economic and social conditions of each country. The universities, with their excellent staff and facilities, have a most important rôle to play in meeting these needs for teaching materials.

43. Interest in agricultural development is rightly being focussed more and more upon the farmer, the farm family and the rural community. Some very interesting and encouraging developments have recently taken place in institutional farmer training in East Africa and are described in this paper. There is scope for far greater development along these lines and this is considered worthy of special interest and support from the more advanced countries.

44. The potential contribution of educated women to agricultural and rural development is incalculable. So far, the fundamental importance of this has not received the recognition and support it deserves. There is evidence of significant change in attitudes,however. This needs to be matched in developing and expanding the opportunities for education, technical training and employment opportunities for girls and women in all aspects of rural development but particularly in such fields as agriculture and home economics. Everything possible needs to be done in order to ensure that women can make their full and proper contribution to the development of the physical and human resources of rural Africa.

References overleaf

Appendix I: Agricultural Population as a Proportion of Total Population in African Countries - page 20

Appendix II:Extract from FAO Trade Yearbook 1966 - page 22

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APPENDIX I

AGRICULTURAL POPULATION AS A PROPORTION OF TOTAL POPULATION IN AFRICAN COUNTRIES *

AREA AND COUNTRY	1965	1975	1985
NORTH-WEST AFRICA			
Algeria	60%	52%	45%
Libya	60	52	45
Morocco	55	46	38
Tunisia	60	54	48
Other N.W. Africa	58	49	42
WEST AFRICA			
Dahomey	84	79	74
Gambia	89	84	79
Ghana	60	55	50
Guinea	85	82	81
Ivory Coast	86	80	73
Liberia	80	75	75
Mali	90	86	84
Mauritania	89	84	79
Niger	93	90	88
Nigeria	79	74	68
Senegal	75	71	69
Sierra Leone	89	85	81
Togo	79	76	73
Upper Volta	88	87	83
Other W. Africa	80	71	59

APPENDIX I (cont'd)

AREA AND COUNTRY	1965	1975	1985
CENTRAL AFRICA			
Angola	84%	82%	79%
Burundi	95	91	88
Cameroun	84	83	81
Central African Republic	85	77	68
Chad	95	92	87
Congo Brazzaville	65	60	53
Congo Democratic Republic	70	62	53
Gabon	84	80	70
Rwanda	95	91	88
Other Central Africa	81	77	71
EAST AFRICA			
Ethiopia	89	84	78
Kenya	84	82	77
Madagascar	84	78	71
Malawi	80	75	71
Mozambique	69	64	60
Rhodesia	75	67	60
Somalia	89	85	80
Tanzania	95	93	90
Uganda	91	87	83
Zambia	81	73	65
Other East Africa	86	80	74

* Figures being used in the FAO Indicative World Plan derived from U.N. population statistics and estimates and projections made in FAO for urban/rural populations.

APPENDIX II

EXTRACT FROM FAO TRADE YEARBOOK 1966

Value Summary of Agricultural Trade 1965

Country	Total Trade	% agricultural	Food	
			Exports	Imports
	(100,000 US Dollars)			
Cameroun	1,392	82	770	144
Central African Republic	264	46	40	29
Chad	272	91	32	29
Congo (Brazzaville)	467	55	11	65
Ethiopia	1,037 *	99	832	80
Gabon	1,049	42	15	57
Gambia	137	97	20	23
Ghana	3,177	78	2,111	495
Ivory Coast	2,772	94	1,747	335
Kenya	1,457	74	771	269
Liberia	1,428 *	16	19 +	152 +
Libya	7,965	1	6	408
Madagascar	917	92	665	204
Mali	157	96	94	78
Mauritius	658	94	620	222
Morocco	4,302	75	1,650	1,308
Nigeria	7,284	70	1,603	657
Malawi	322	99	129	43
Zambia	5,324	3	60	220
Senegal	1,285	97	211	569
Sierra Leone	852 *	17	39	199
Somalia	361 *	96	303	159
Sudan	1,952	98	272	461
Tanzania	1,794	82	536	96
Togo	271	95	125	42
Tunisia	1,199	84	221	337
Uganda	1,791	85	986	52
UAR	6,012	72	837	2,250

* 1964 figures

\+ 1963 figures